Claims:

1. Isolated human soluble guanylyl cyclase α1/β1 (hsGCα1/β1) purified to apparent homogeneity.

2. A method for the production of α1 and/or β1 subunits of human soluble guanylyl cyclase comprising the expression in prokaryotic or eukaryotic host cells of expression vectors containing the DNA sequence of hsGCα1 and/or hsGCβ1 and obtaining the subunit or subunits.

3. The method for producing the α1 and/or β1 subunits of human soluble guanylyl cyclase according to claim 2, wherein the step of obtaining the subunit or subunits comprises a lysis of the cells, the affinity chromatography of the cell lysate, and the subsequent elution of the subunit or subunits.

4. The method for producing the α1 and/or β1 subunits of human soluble guanylyl cyclase according to claim 2 or 3, wherein the expression vector contains at least one additional DNA sequence coding for a domain for the specific affinity chromatography (affinity tag) with appended protease cleavage site.

5. The method for producing α1 and/or β1 subunits of human soluble guanylyl cyclase according to claim 4, wherein the expression vector contains the DNA sequence for hsGCα1 with affinity tag, the DNA sequence for hsGCβ1 with affinity tag, the DNA sequence for hsGCα1 with affinity tag, and the DNA sequence for hsGCβ1, the DNA sequence for hsGCβ1 with affinity tag and the DNA sequence for hsGCα1, or the DNA sequence hsGCα1 with affinity tag and the DNA sequence for hsGCβ1 with affinity tag.

6. The method for producing human soluble guanylyl cyclase α1/β1 (hsGCα1/β1) comprising the separate expression in prokaryotic or eukaryotic host cells of an expression vector containing the DNA sequence for hsGCα1 or hsGCβ1,

extraction of the subunits, and reconstitution of subunits hsGCα1 and hsGCβ1 to form the dimeric guanylyl cyclase α1/β1 (hsGCα1/β1).

7. The method for producing human soluble guanylyl cyclase α1/β1 (hsGCα1/β1) according to claim 6, wherein the step for the purification of the subunits comprises a separate lysis of cells containing hsGCα1 or hsGCβ1, the separate affinity chromatography of the cell lysates, and the subsequent elution of the subunits.

8. The method for producing human soluble guanylyl cyclase α1/β1 (hsGCα1/β1) comprising the coexpression of the DNA sequences of hsGCα1 and hsGCβ1 in prokaryotic or eukaryotic host cells, a lysis of the cells containing hsGCα1 and hsGCβ1, and affinity chromatography and subsequent elution of hsGCα1/β1.

9. Use of a nucleotide sequence encoding the hsGCα1 and/or hsGCβ1 subunits of human soluble guanylyl cyclase α1/β1 for somatic gene therapy.

10. Use according to claim 9 for the prevention and therapy of atherosclerosis and its complications, of restenosis, ischemia (infarction), peripheral arterial occlusive diseases, and arterial hypertension as well as for the prevention of atherosclerosis in patients with risk factors.

11. Antibodies against human soluble guanylyl cyclase α1/β1 (hsGC α1/β1), obtainable by immunization of a mammal with hsGCα1/β1, the α1 or β1 subunit, or immunogenic peptide fragments thereof and isolation of the antibodies.

12. Antibodies according to claim 11 obtainable by immunization of a mammal with the peptide fragment Phe-Thr-Pro-Arg-Ser-Arg-Glu-Glu-Leu-Pro-Pro-Asn-Phe-Pro, or parts thereof, or immunogenic peptide fragments that overlap with this fragment.

13. Antibodies according to claim 11 obtainable by immunization of a mammal with the peptide fragment Lys-Gly-Lys-Lys-Glu-Pro-Met-Gln-Val-Trp-Phe-Leu-Ser-Arg-Lys-Asn-Thr-Gly-Thr-Glu-Glu-Thr or immunogenic fragment or immunogenic peptide fragments that overlap with this fragment.